New York Notebook, N-86-04-28

This notebook covers the period April-May 1886. All of the entries are by Edison except for one set of notes and drawings by John F. Ott relating to carbon filament experiments. Most of Edison's notes concern fundamental magnetism experiments, including the determination of the Earth's magnetism and the lines of force of the various planets around the sun. Other notes and drawings deal with quadruplex telegraphy, the phonoplex, telephones, and dynamos. Included also are a set of notes by Edison labeled "Reasons against an Alternate Current Converter System" and some calculations regarding the cost of flowers and other plantings for Edison's property at Fort Myers. The first page of the book is stamped "Laboratory of T. A. Edison, 292 Avenue B cor. 17th St." There are 294 numbered pages. At least one page at the end of the book has been torn out.

Blank pages not filmed: 8-9, 122-125, 266, 269.

Missing pages: 267-268, 271-272.

N-86-04-28

LABORATORY OF
T. A. EDISON,
292 AVENUE B. CORR. 17TH ST.

N-86-04-28 1

Laboratory Notes

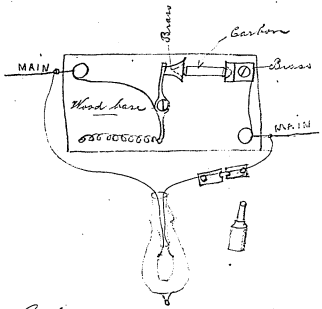
01/014 April. 28. 86.

LABORATORY OF
T. A. EDISON,
292 AVENUE B. CORR. 17TH ST.

April 28 86

J. E. Ellis

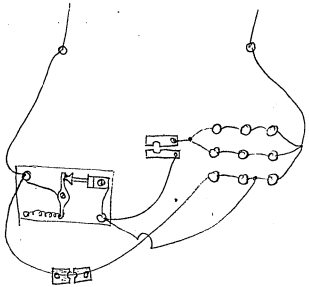
Made Nonfusible cutout



Cut small strips of Chinook
" strips of Bard board
Carbonized at Lamp Factory

Made following connections on 100 Volt circuit.

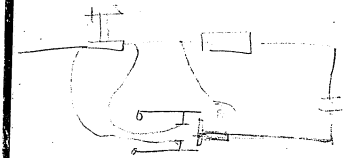
J. F. Ott

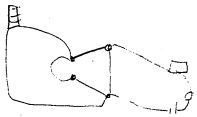


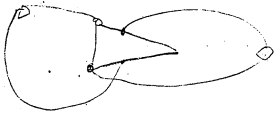
Wood carbon too high resistance to work on 100 Volt circuit, better be tested on 1000 Volts

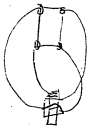
Paper Carbon was too low enough came to red heat but wasted away in open air

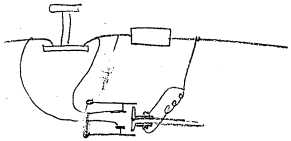
Made strips of wood and paper coted with Plumbago mixed in gum Sandarch, This I found when made small enough in section that two Insulators current tested it, or caused it to undergo a change it would waste away entirely,

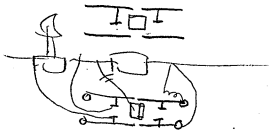


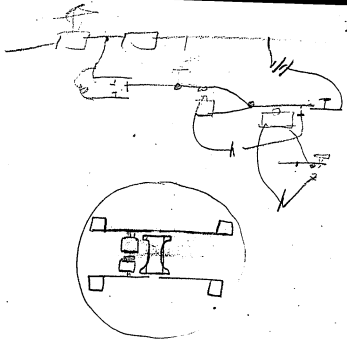






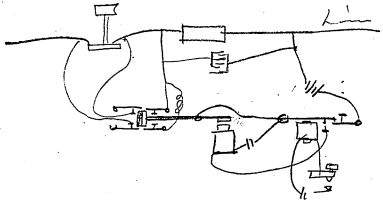


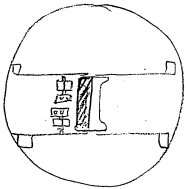




May 8 1886 TAE

Phonoplex





520 000,
100 000 000
52 000 000 000

160,

17

$\frac{1}{8}$ 96 foot

5 20,000

52,000,000,000

880 000,
3
2,640,000,000,000

$\frac{1}{12}$

2640,000 000 000 / 500
200
400

52 000 000 000
30
260 000 000 000

$\frac{1}{12}$ ohm 100 000 wide
foot deep
14 mile deep $\frac{1}{\text{millionth of ohm}}$

2 — $\frac{1}{20}$
4 "
8 — $\frac{1}{100}$

2640 000 000 000 000
3
1320 000 000 000 000

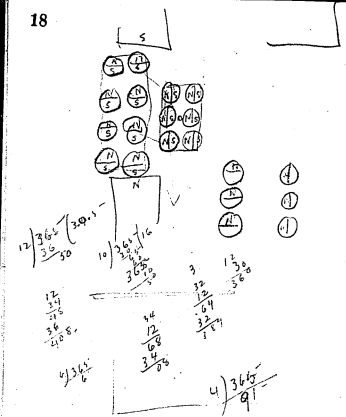
14 / 200,000 (14285
14
60
56
40
28
120
112
80
70
100
98
2

16 — 1200
32 — 600
64 — 80
75 — $\frac{1}{1000}$
150 — $\frac{1}{2000}$
300 — 4
600 — 8
1200 — 16
2400 — 32
4

2 — 320
4 — 611
14 — $\frac{1}{14}$ 80
29

$\frac{1}{75000}$ per mile.

14285
1,000,000
14285 / 1,000,000,000
57140 / 000,000,000
57140 / 000,000,000
628,000,000,000



19,046,666,000,000

19,046,666,666,666,000

33000 / 628,540,000,000 (19,046,66

33000
295540
297100
1540000
1320000
2200000
1980000
2200000
1980000
2200000
1960000
2200000

19 2
76 4
304 8
1216

19046666
33000
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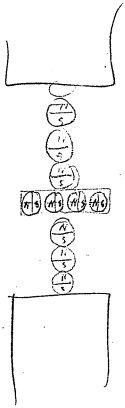
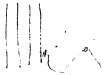
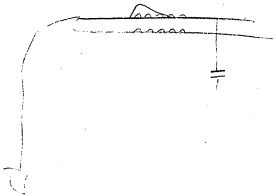
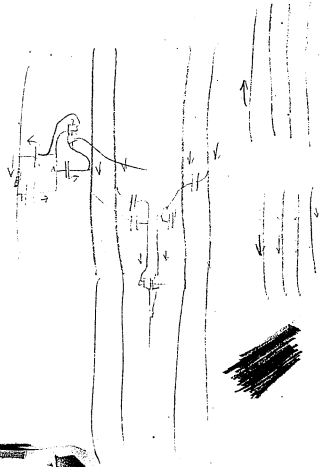
57139998
5391998000
6281

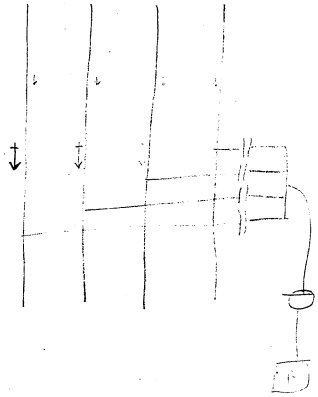


The induction of a coil in a glass globe of Oxygen should be greater than in other

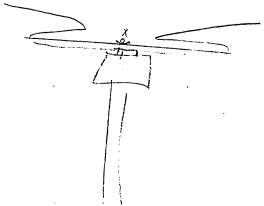








May 8. 1886 7.



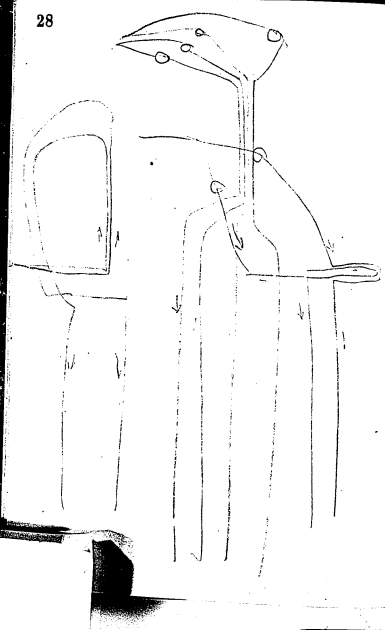
Telephone Receiver using small ball which will be thrown up by electric current when amplify sound

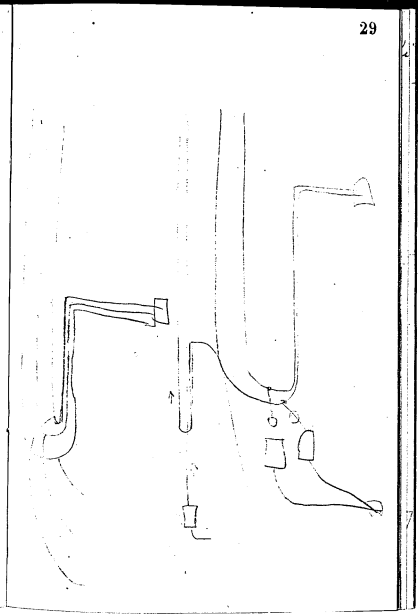
12.

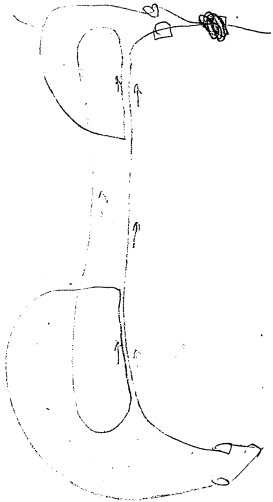
90 — 572.30 / 100 / 57 x 90.00

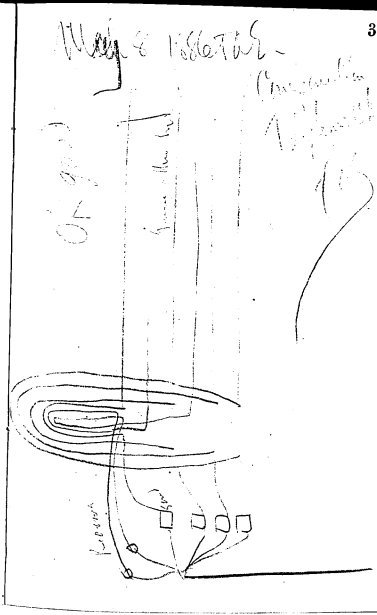
267.00	6
131.5	3
65.500	1 1/2
32.750	6/16
16.250	3/8
8.150	3/16
4.075	3/32
2.000	3/64
1.000	1/32
500	
250.	

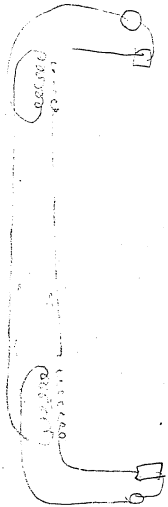
6

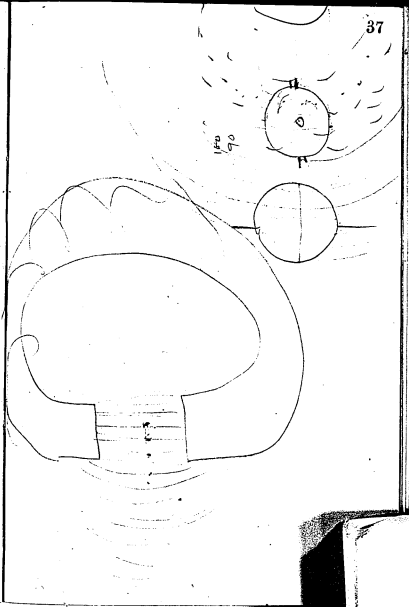




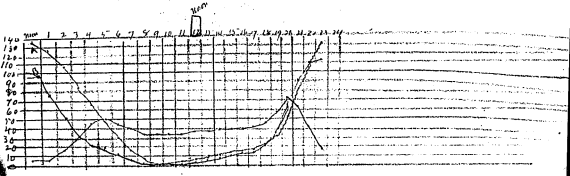






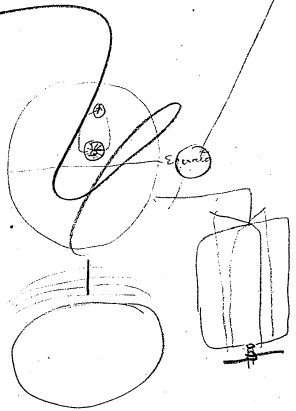


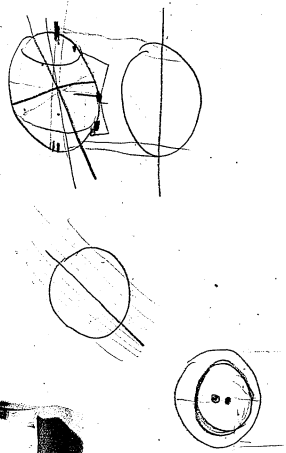
A Stilbene
B Sigma pore



May 9. 1886 T.A.E.

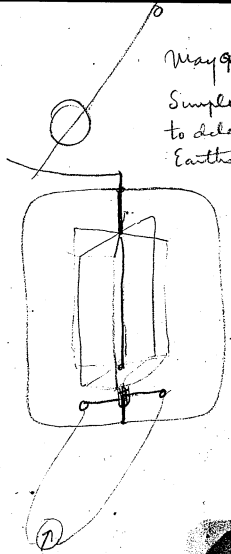
~~Small hand dynamo driven by~~
Electromotor





May 9 1886

Simple dynamo to determine Earth's Magnetism



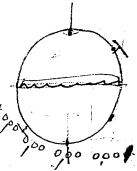
use for dynamo & motor.

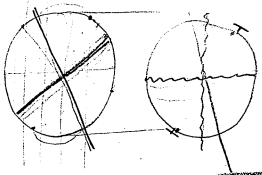
20
6
120.

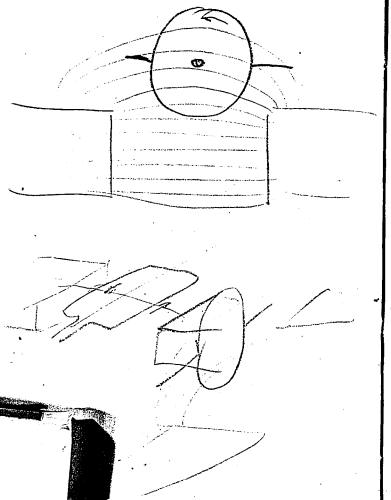
33000) 8,1464 000 000 000 000 000 000 00 (2,764,74000,000 000 000

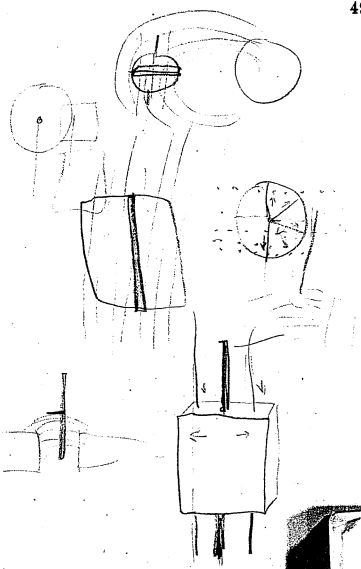
6 6000
1 86400
1 6500 00
2 14000
1 9810 00
1 6000 00
1 3200 00
2 8000 00
2 6400 00
1 6000 00
1 3200 00
0

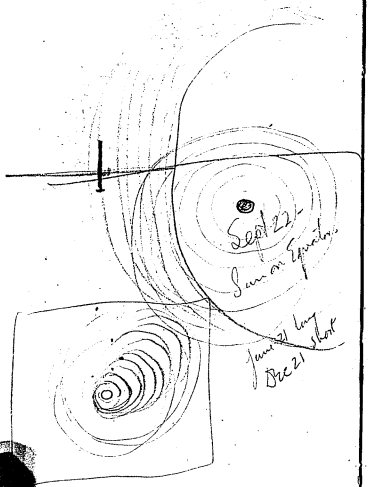
2564840000 000 000

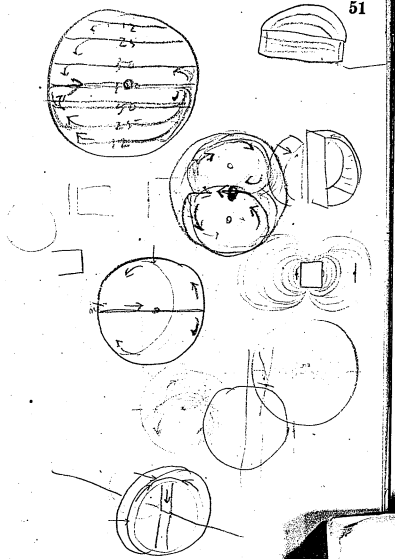









Sept 22
Sun on Equator
Dec 21 shot



16.66 2/3
5 2 5

16.66 2/3
5.250
7875
8330
3332
8380

8250
2625
3
7875

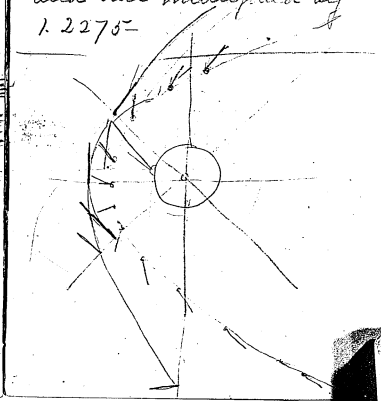
60 | 8754.375 | 145.9
60
2754
2400
3540
3000
5400
5400
3

4 | 5.000
1.250

1.2275
4
4.9000

13
13
75
13
220 | 145.9.0 | 1.
135
109

Equal to the weight multiplied by the number of feet in the radius of the circle and this product by the square of the number of revolutions per second. and this multiplied by 1.2275=



10 lbs. 8 ft. 15 revolutions

10
8
80

10
18
180
225
50
1125
1.2275
6625
78700
22500
22500
1250
13809.3250

10
8
50

225
50
1125
1.2275
5625
7875
22500
22500
1250
13809.3750

1.2275
50
61.3750
225
30687500
12275000
12275000
13809.3750

1.2275
10
12.2750
8
61.3750
225
30687500
12275000
12275000
13809.3750

1.2275
10
12.2750
9
61.3750
225
30687500
12275000
12275000
13809.3750

18
8
225

8000 m. 4000 m.

1 lb. rel. 1

4000
1.2275
20000
28000
8000
8000
4000
4910.0000 lbs. 245.50
40
91
80
110
100
100
100

100 | 245.50 | 2.4550 tons
200
455
400
550
500
500
500

854000 d.

427000

427000
1.2275
2135000
2989000
854000
854000
427000

20|51314200000|2565657.125 125.571
200
565
500
657
600
571
500
712
500
125

40
113
100
131
120
114
100
142
140
25
20
500
400
100

427000
133.864
1708000
2562000
3416000
1281000
1281000
427000

10|571599280000|2857996
200
857
800
570
500
796

40
171
160
115
119

159
140
189
140
180
140
40

H-du

24|1.00000|.4166
96
40
34
160
144
160

60|.4166 |17
360
766

60|.41666|6944444|.115574
360 60
866 94
540 60
366 344
340 300
266 444
340 420
24
240

.1157
1157
8099
5785
28579

21857
157
133.8649

24/1.00

25/1.000 .03
75
250

25/1.00 .04
100

24/.040000 .001666
24
160
144
160
144
160

60/.0016660 .00002776
120
466
420
460
420
400
360

60/.00002776 .00000049
240
376
360
160
120
40

427000 radius.
1 lb.
12 in. 25 da.

.0000000492 in. per sec.
.0000000492
~~.0000000984~~
~~.0000000868~~
~~.0000004428~~
~~.0000001968~~
.0003 ~~.0000000002420 64~~
~~.27427000~~
~~.0000000016944280 00~~
48412 8
968256
.0000000103361308 ~~000~~
1,2275
51680654 0
7235291 56
2067226 16
2067226 16
10336130 8
.00000 0126876 00055 7 ~~00~~

450 ft sec. 10 lbs.

8 54 000 di-
3
62000

5250 ft

5250
4000 hr- mi

454 | 21,000,000 ft- | 46,666.66 2/3
1800
3000
2700
3000
3700
3000
2700

45000
1.2275
225000
315000
0000

36 | 1000000 | 126876 | 0000000 6343 3
120
68
60
87
76
60
160

152 | 0000000 | 63432 | 0000000 6343 3
200
343
304
438
456
380
304

450
10
4500
5
22500
1.2275
112500
157500
45000
45000
2500
27618.75 00

13,873
2
27746

10 lbs. 5 ft. 15

225
100
22500
1,2275
112500
15750
45000
45000
225000
7,761 8.75 00

1,2275
10
12,275 0
10
122,75 00
1 2 2 7 5

122.75
225
6137 5
245 50
245 50
27,61 8.75
2 1/2
138093 75
55 23 75 0
79,046.87 5

450
2 1/2
225
900
112 5

27.618.75
2 1/2
138093 75
55 23 75 0

425 000

1.2275
10
12.275
10
122.75
225
6137500
2455000
245500
27613.75 00 lbs

~~245000~~ mi - india -
1 lb.
15 ins. per. sec.

1.2275
245000
6137500
49100
24550
300737.5
225
15036875
60147500
6147500
180 | 676659375 | 676659375 | 33829
600
766
700
665
600
659
600
593
500
937
900
375
300
75

20 | 676659375
20
76
60
165
160
59
40
193
180
137
120
175

$$\frac{c}{2\pi} = r$$

radius – 5 ft.

30
10 | 30
3

$$\frac{4 \times 3^2}{32.16} = \frac{4 \times 9}{32.16} = \frac{36}{32.16} = 24 \text{ ha}$$

36.000 | 1.11
32.16
3840
3216
6240
3211
4

$$c = \frac{v(2v+2u)^2}{rg} = \frac{4v^2}{g} v.u.n^2 =$$

$$\frac{4v^2}{32.16}$$

450 sec
60
27000
60
525 | 1620000 | 308.5
1575
45000
42000
3000
2625
50

225
50
11250
1225
56250
78750
225000
225000
12500
13887.50

400000 mi dia.

8
320000
40
12800000 rd.
5½
640000
6400000
70400000
211200000 ft. radius.

20 | 176.6068 | .08830
160
166
169
60
6

1 − 2½ ms.
60
150
60
8640 sec.

.08837 mm

1 − 60 | 24.0 | 60 | .400 | .0066
24.0 | 240
40

60 | 1.000 | 60 | .0166 | .0002 | .0002
60
400
360
40
120
46
00189
00054
.0000000729

211200000
0000000729
190080000
42240000
147840000
14.39648480000

14.39648
1223
71982840
10077896
2879296
2879296
4319448
172.7688960000

10
5
50

225
50
1250
1250
7850
7500
2250
2250
1250
1250
60
60
1200
32
24
15
360
360
31

375
32

3750
3216
2250
1750
1500
2500
1250
1250
0000

5-)11250
2250
3216
3500
2500
3500
3500
0000

10

1

1

30)11250(375
90
2250
2100
1500
1500

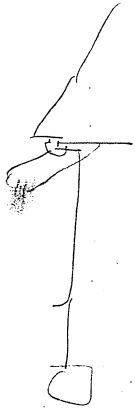
375
64
2250
1750
1500
2500
1250
1250
0000

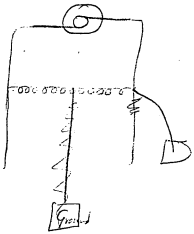
Quad. 375 Watts.

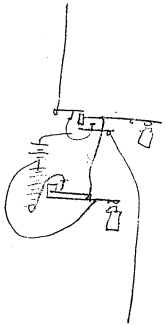
4

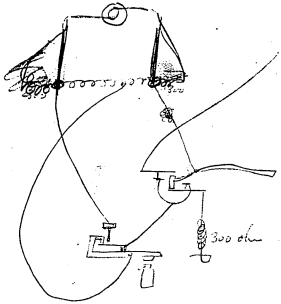
380.

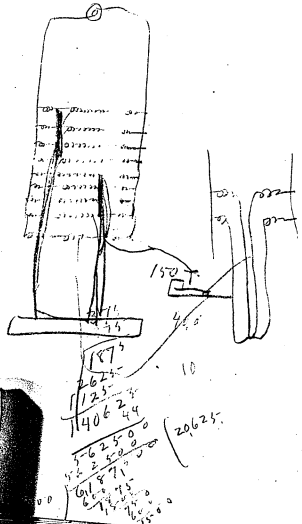
3 4

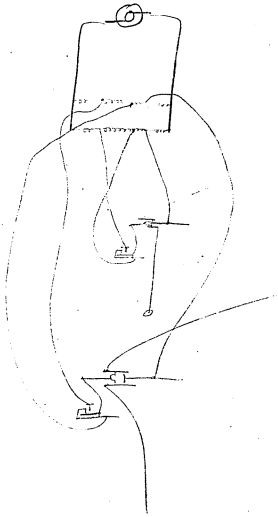


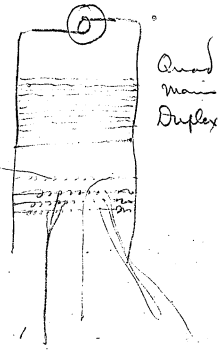


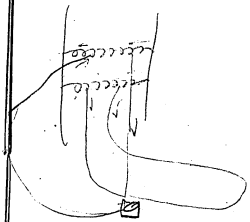



300 ohm


150
10
20625




Quand
Main
Duplex



1440 feet sec

60) 86660 (1440
60
266
240
266
240

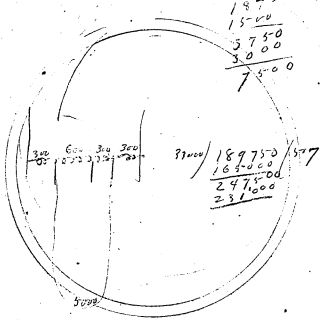
60) 86660 (1440
60
266
240
266
240

1000 hours
5000
5000
60) 520,000 (86660
480
400
360
400
360
40
60
519990

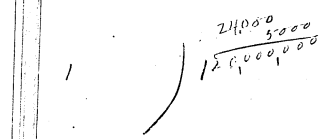
41257
46
247500
165000
189750
15000

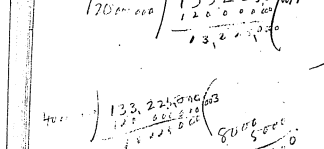
350 valto

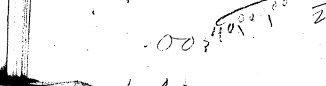
6,187,500 (41257
6000
187
15000
37500
30000
7500

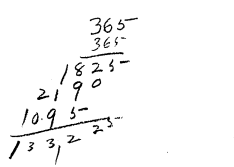


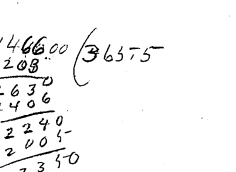
39000) 189750 (57
165000
247500
231000

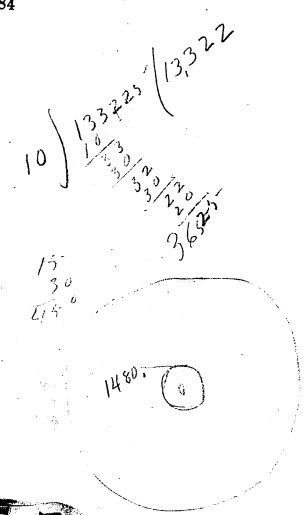


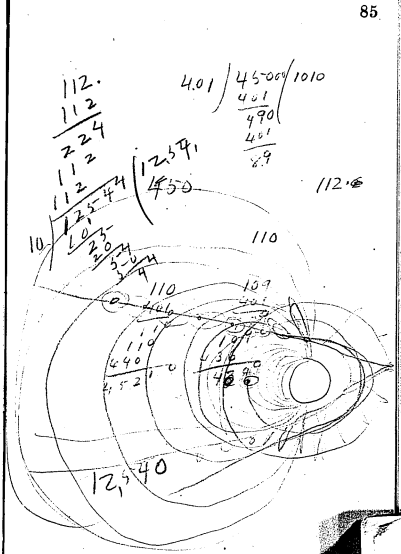









13322
10
1480.


112.
4.01
1010
112.6
110
12,540

4023 second

86400 | 347607.750 (feet daily total
345600
2007.750
1728.000
279.750
21.92

24
1440.00
864

66211
5250
331052
13221.22
331300
347700.750

24 | 1589241 (daily total
66211 - hourly
144.9
144.00
24
24

86400
1440
2160.00
2160.00
3456.00
3456.00

95
2
190.
3
570.000
3
3
2000
1720
2920.00
3.385
15.00
14.00
1.00
3.5

1589041

401 | 4023.00 (1000
401
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10

190.000 | 1000.000000 (5.22
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005

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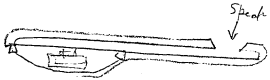
1
200

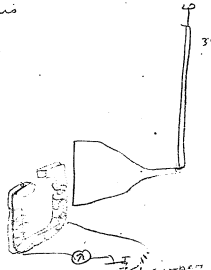
O

May 15 1886

Telephone



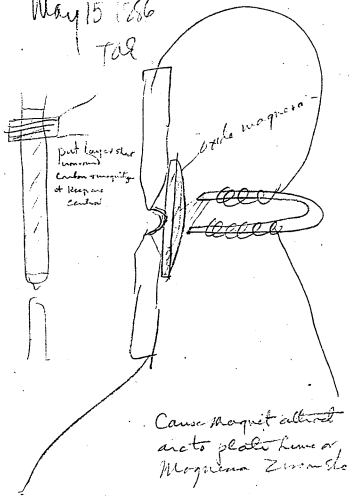
Is iron merely a non polarizable material whereby contact is made with the air to produce stress, ~~for~~ Try this



Hollow core power variously lagged in see of change lines force —

Note — Try if alloys of iron with other metals are magnetic investigate their properties.

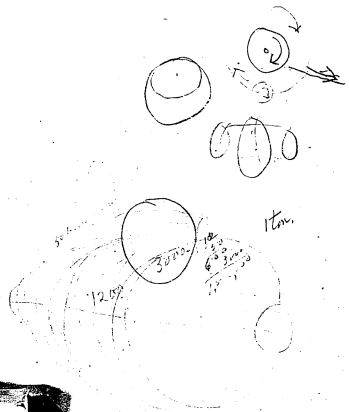
May 15 1886
TOR

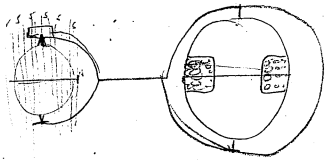


Cause magnet attract
acts glass home or
Morgiana Zimmsho.

Jrillion

29.





Notes -

Comet dilatate as they recede & contract as they approach the Sun
p 102 Vol 6 Astron Society - Handel

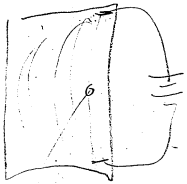
Tail of Comets always point away from Sun -

in Sun spot period Corona extends great distance from Sun Spectroscope shows its gas - no sun slight Corona shown in Spectroscope that light comes from solid -
Color white while extended
Corona pink - ~~one~~

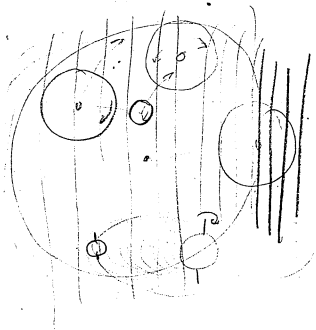
my theory is that Electric arc
occur on surface Equatorial
part sun reduces EMF
on parts & give gre at dif
EMF where arcs are, &
lines of force from sun
attracts arc out into
space, as magnet attracts
arc of arc light, one picture
shows several Corona streamers
~~was~~ Knife shaped, These
are matter from arc's attracted
out by lines of force -

May 17 1886 +09

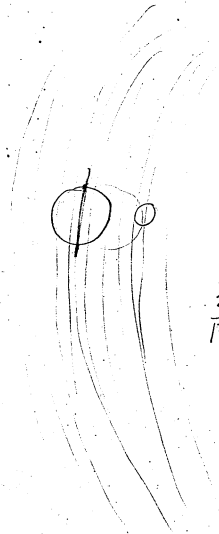
Apply Magnet also
Coil also current
to increase sensitiveness
to Astronomical observations



Hydrometer. Res of specific grav
increasing



24
27
168
48
648



2450
2950
12000

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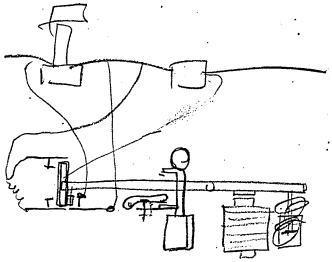
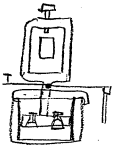
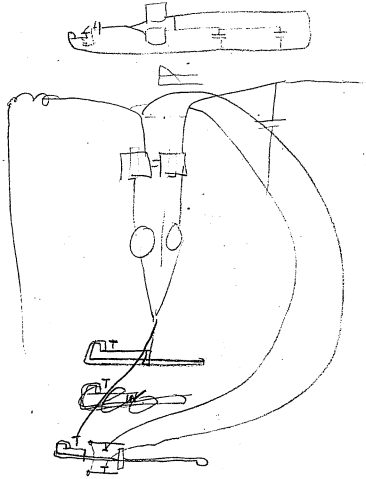
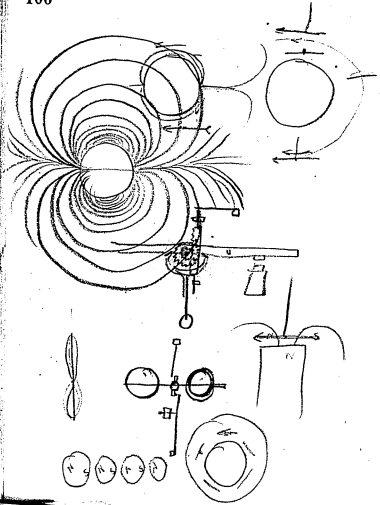
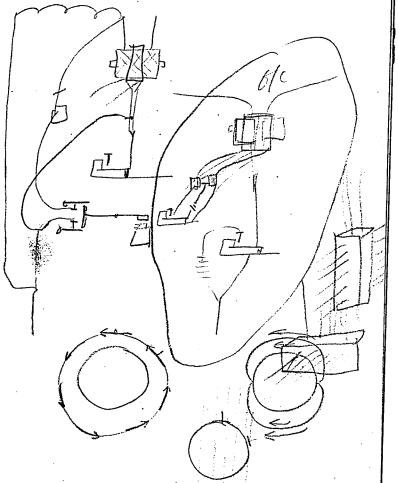
6008.0000










C/C

220000
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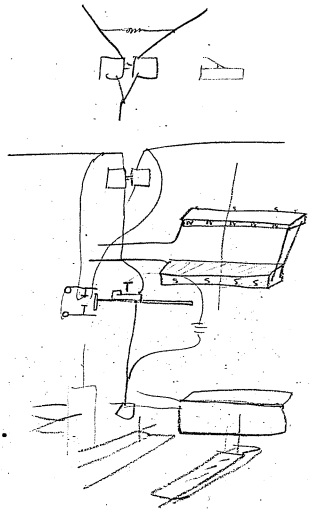

365
365
825
190
219
1095
1332 - Earth

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115728) 93.000.000 (

224 Venus
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50176 115728

115 Venus

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1 47700
1 15720
31280

36

1000
4
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16000 Cube
11,572 - Venus

11,572) 50176 (4.3
46288
38880

6000
4
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16000) 133223 (8.326
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8.65 3² : 224.7² :: 1 : .7233³ :

~~1334440~~ . :

1.33225 : 50172 : 1 : .32841818

.7233
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15698 4867
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352.3 : — 2 : : 1 : .72333

352.3 — : : 1 : .7233
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257.71179

7

352.3 : 257.7 : : 1 : .7233

126949.69 : — : : 1 : .378403718
.37840371

12694969
88864776
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88864783
38084907
48037.87 3 67034229

352.3
352.3
10689
21378
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126949.69

324.7
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187729
8988
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4494
50490.09

43750 | 133.4440.9 | 3

352.3
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10689
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.7233
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1569488867
10463.25778
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.37840371783 27

133225
.328418
1065800
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3 : 9 : 1 : — 3

3)9
3

3 : 9 : : 1 : 3

3:9::1:—

3) 9
3

3:9::1:3:

365.3:
365.3
10959
18265
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10959
133443.09:— :::1³:.7233³

133443.09:— :::1³:.378503718337

133443.09: 85568.7 : 1 : 378503718337

85568.70 | 226.8
40 | 1 05
80
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22640
2868 70
2641 60

440
4520

.7233
.7233
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21699
14466
50631
.5231 6289
.7233
1567 4886 7
1569 4286 7
1046 3257 8
3663 1402 9
.3785 0371 8337
133443.09
3706 5334 6553 3
1135 5111 5501 1
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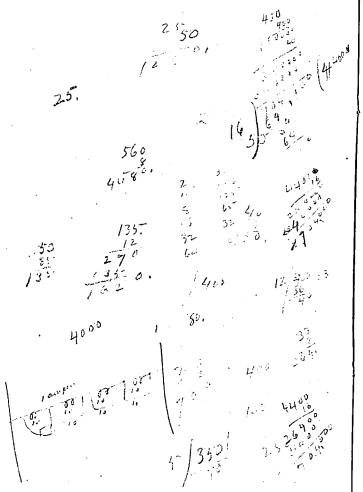

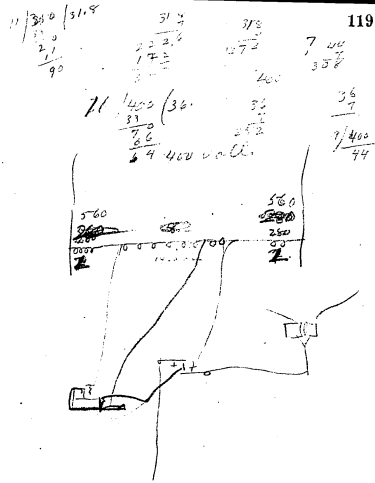

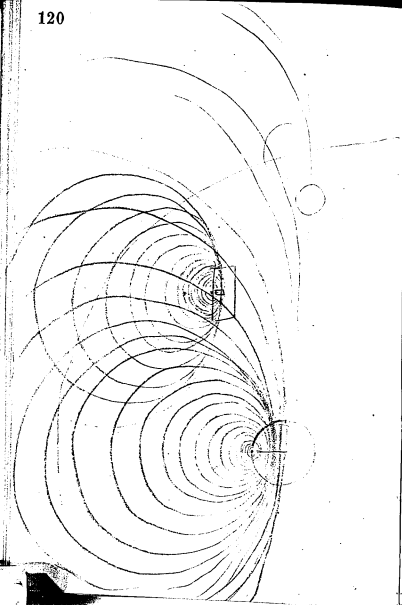

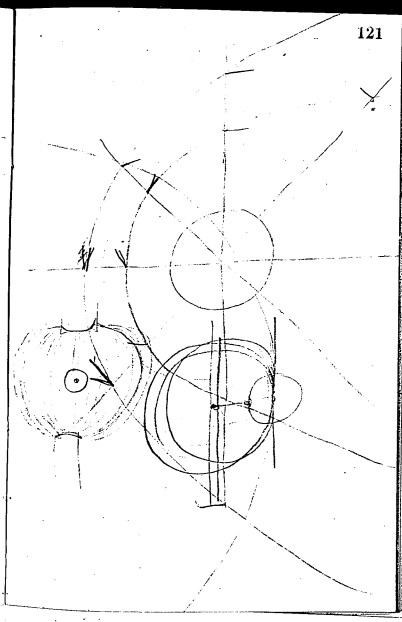

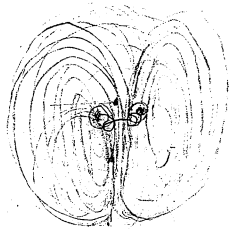

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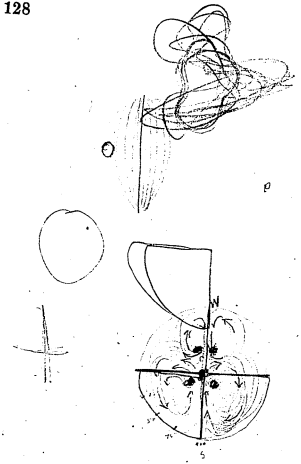
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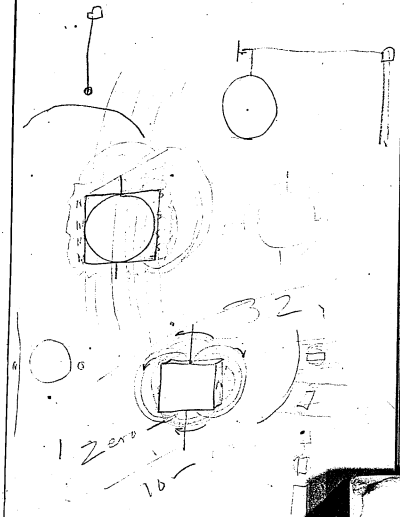
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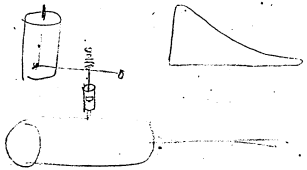

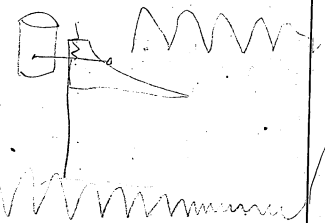

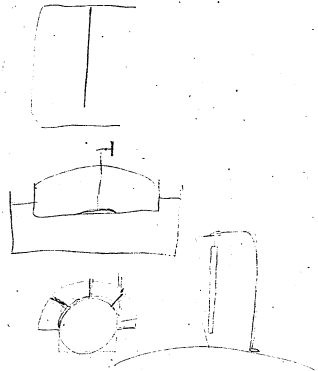

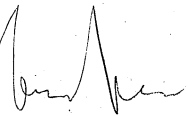

Mercury	214. 500 000.	Length
Venus	410 500 000.	
Earth	555 000 000.	Orbits in miles
Mars	846 000 000.	
Jupiter	2 880 000 000.	

Mercy	789. 888	mile terminal — orbital circum in Res
Venus	3,147,774	
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Jupiter

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Earth

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True Cutting

Orbital

Mercury	213,720,112
Venus	395-,352, 226
Earth	546.,330, 000
Mars	837 ,333, 762
Jupiter	1 844 130, 000

Dia-

Mercury	2992
Venus	7660
Earth	7918
Mars	4211
Jup	86,000

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Mercury-	35. 750 000
Venus	66. 750 000
Earth	92- 333, 000
Mars	141 000, 000
Jup	480 000, 000

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The sizes of these discs deviated in their real distances orbital

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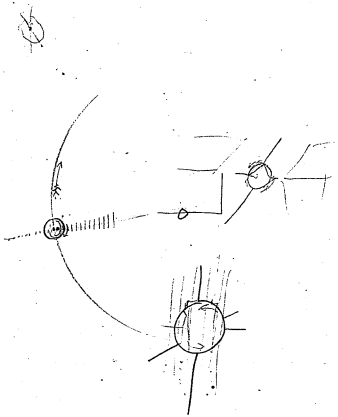

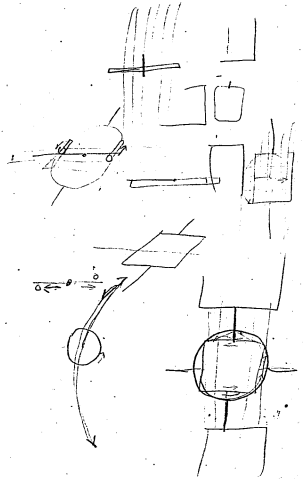

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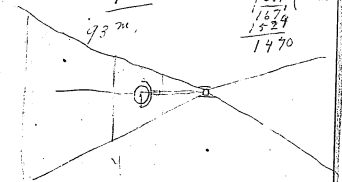

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1.00	1.25
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1.65	1.60
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1.25	1.65
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1.10	2.65
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1.30	$52.75 – flower seeds only
1.50	page 8 to page 21
3.55	
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Grasses

$1.30 –

Everlastings –

.50
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Climbers

1.00
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Greenhouse –

4.80
1.40
1.45
7.65

Seeds Rare & Beautiful plants.

3,10
8,25
7,55
13,45
32,35

177,30
281,90
192,30
111 25
240 00
272,50
1275,25

Rare & beautiful plants.

8,85	28,00	7,00
2 25	4,25	7 00
14 55	15,50	15,00
22,25	4,75	7 15
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10 90	2,75	9,25
5 25	10,00	8,25
8,75	5 25	6,00
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11 00	23,75	1 00
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3.50	2.00
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Aurora – Copper No 8 to Boston
300 volts df – 10000 ft lbs.
each copper wire, – each wire
16 horse power – Rodfordia 2592 hp –

240 miles, 300. volts.
16
1440
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0

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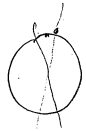

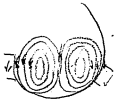

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33000 | 1 lb | 82570

1 Watt per mile. $1\frac{1}{4}$ inch wide. 44 ft lbs.
inch 704
~~foot~~ $3\frac{1}{3}$ horse power.

100 000 ft lbs per square foot per mile of Copper. melted glass say 1000 more than 100 ft lbs per mile + square foot
Square mile ~~[illegible]~~ 82570 hp.

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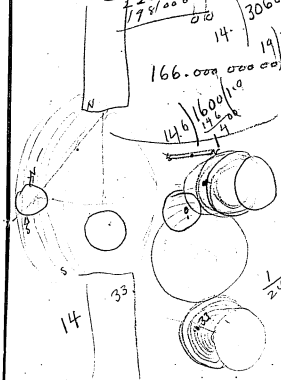

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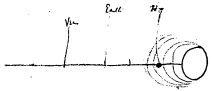

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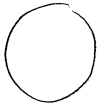

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14

1st

The sun is a solid globe of molten matter revolving on its axis once in 25-¼ Days

2 A powerful Electric Current circulates around the whole of its body from west to East parallel with the Equator and to the poles,

3 This Electric current is sufficiently strong to keep all its matter except at the poles and Center ~~at~~ rigid meanderers

4. ~~breakage in~~ Lines of force ~~are~~ pass through its body in the same manner as a Cylinder of wire wound so the wire would be in the same direction as the Current circulating in the meanderisant matter, ~~These lines of force 1/2 [illegible] one 1/2 [illegible]~~

half of these lines pass through the sun the other through space from pole to pole forming a vortex

5- Excentricity of the lines of force due to the attraction of the sum total of the lines of force of all the planets + stars causes the sun in its rotation to cut its own lines of unequal strength + thus produce its current, + heat,

6. planets are held in their orbit & propelled by the mutual attraction of closed current currents

7 Except the shell all planets are matter & conduct electricity

8 The lines of force weaken as they recede from the sun at the square of the distance hence the 1/2 of the planet receives the sun's powers through lines of force stronger than the 1/2 furthest from the sun. This difference produces powerful currents in the matter matter + causes rotation of the body on the sun's axis.

9 - These currents causes lines of force to proceed out of the ~~earth~~ planet and produce a field ~~dipol~~ diagmatical with the axis so the magnetic poles are near the astronomical poles

10. This system shifts ~~completely~~ at every revolution of the planet hence there must be a diurnal variation of the needle, ~~as~~ since the axis shifts there must be an annual, ~~as~~ since the ~~sy~~ symmetry of the lines of force are disturbed by planetary conjunction there must be secular variation,

11. One ½ of the planet is positive Electrified N & the other S. ~~by the~~ passing through the lines of force the poles of which are equatorial, & zero — the signs should change once in 24 hours and now 2 max & 2 minima in particular for the Earth.

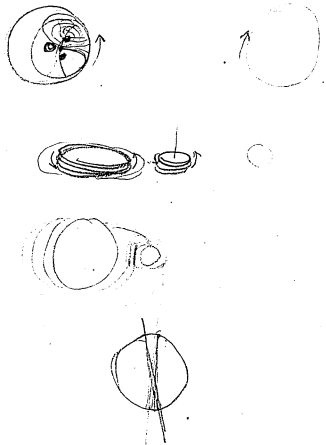
12. ~~Non conducting~~ matter in Vacuo or space conducts Electricity like a metal ~~whereas~~ Gaseous or non conducting substances like the sun and other non conducting matter as or ~~pro~~ cold conductor as proved by the Carbon wire in filament lamp.

13. gravitation ~~Attraction~~ has no existence ~~and~~ all weights are due to Static or Current ~~Attraction~~.

14. Lines of force passes from the North pole of the earth to the south. pass along

the circumference and by
curved lines towards
to ~~the end~~ unlimited space;
The Body of lines of 1/2 section
of ~~the ring as~~ of the
ring of the Vortex is the
line of balance; magnetic
or Conducting matter on this
line is neither attracted or
repelled by the ring of any conducting
Matter having a Current
in it or electrified is in
space between this line +
the sun it will be
repelled if on the other
side, attracted

15 – Sun spots are due to faults in the matter surface of the sun an electric arc forms across the fault the two side will have less current & diminish in temperature, the arc being mobile & conveying a current will be attracted outwardly to the center of strength of the sum of forces just as an ordinary electric arc tends to go to the center of the L of F of a magnet, The arc breaks long before it reaches this point hence the incandescent matter surrounding the sun –



16 prominences are arcs of small diffusion of potential but with great current strength due to great mass of matter

17 The tails of comets are due to the breaking of the arcs from repellent action as they approach the sun

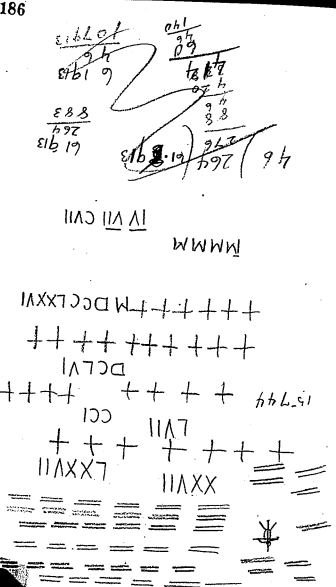
18 Diffusion or Condensing power of different planets instead of these forces gravity must be correct

19 all planets were once projected from the sun

by faults in the equatorial strata. The region from which they were projected was at different temperature & the matter must have been necessarily different. The moment the general current of the sun ceased to pass through the detached matter attraction never ceased but ~~the problem~~ ~~still has to be solved~~ & it was thrown out into space where falling in a rotary motion ~~and~~ adopted a very eccentric orbit & rotated on its axis. & finally

Eccentricity diminished & it took its regular orbit

19 — Comets are matter recently thrown from the sun the reason a comet can never fall in the sun is that they have powerful currents in them & if they pass Mercury towards the sun they pass the line of no attraction to the line of repellant



so periodically of four spots
is produced by shifting
farther from the sun the
neutral or non attractive centre
of L of F by approach of
Jupiter or other planetary
conjunctions. As more powerful
attraction of the arcs cause
many to break & thus produce
a disarrangement of the
equatorial surface demanding
a great number on all arcs
& creating fewer large arcs
& consequently spots by
compression & by depriving
the poles or edges of faculæ
of currently conductive

Earth LF slip 14.6 times. 7926

Venus 8.96 7856

mars 27.44 4070

jupiter 173.28 92,164

Earth, dual slip

1,157,19

7 074

11 068.

92

14 | 300 / 21.

146

14 / 12. 1.12 92

93
41
139.

139

4070
2744
1630
1630
2440
2440
1100

7926
146
5556
47704
3176
7926
1157196

7896
896
47376
71064
63168
7074

118
118
944
118
118
13924

1000
885
1000.000
783 221
13924.
118
300,000.

300,000,000
300,000,000

25 | 6.86 | 27.44
5.0
185
175
100
100

885
885
4425
7080
7080
7832.25

25 | 224 | 8.96
200
240
225
150

8000 | 300 000 | 37.5
240 000
60 000
56 000
4 000

25 | 4332 | 173.28
25
183
175
82
75
70
50
200

37 | 1000 | 27
37
74
37
37

27 | 173 | 6
162

375
375
75
7
2625
1125
1500

173.

14 | 1000 | 70.
98
200

9 | 885 | 98.
81
7 04

92164
92164
8656
36984
5216
9328
1876
29470289
8 4994

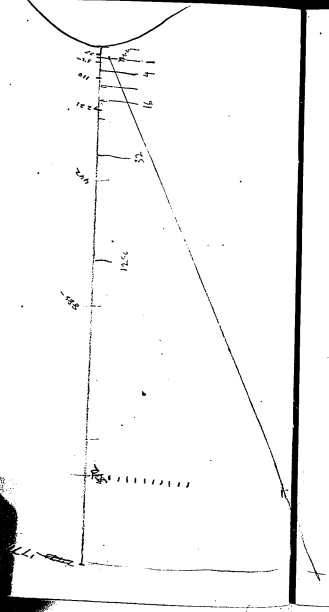
40700
40700
25490
1629000
1658490

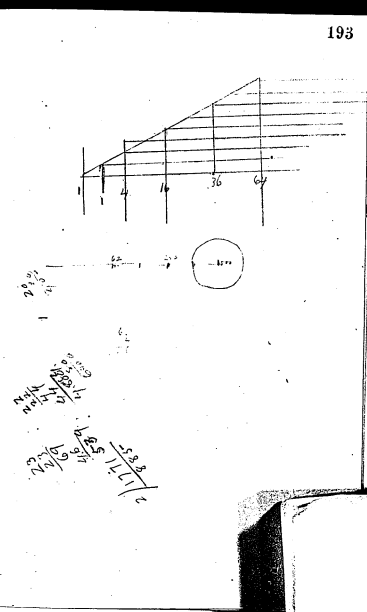
Earth

62 821 476
62 346 816
16 564 900
8.444.202.896

7926
4226
4755
1584
7133
5548
6282147
6

7896
7896
4737
1064
7108
6316
5272
6641
6234





460
460
35 500
192 0
23 04 00 (1.50
12 75
10 79 0
9 50 00
9 9
7

35/1000 (28.57
70
300
250
250
175
250
215

~~860 000~~ 430 000
860 000
1,7 20,000
3,4 40,000
6,8 80,000
13,760,000
27,520,000
110,080,000,

100,000,000
25 000,000
12 500,000
6 250,000
3,125,000
1,562 500
781 250

141
141
564
141
1985
1763
1335
1128
2500
2256
56

35
35
175
105
1225 (16.22

3.5/1000 (285.5
70
300
350
350
2100
2100
25

66
66
396
396
1225/433.6 (3.5
367.5
6810
6125
685

92
92
184
828
1225/8464 (6.9
7350
1114
11025

2857
3
8575

2857
3
8571
7
2857
1
4025
8415
7

2857
3
8571
7
2857
1
4025
8415
7

633/1000 (1.57
633
3670
3165
5050
4433
6170

1000 — Mercury 1
Venus 3.5
Earth 6.9
Mars — 16.22
Jupiter 188.00
Saturn 633.00

188/1000 (5.32
940
600
564
360

59/1000 (144.9
59
410
354
560
531
290
236
540
472
680
590
90

881
881
581
7048
7048
1225/7761.6 (633
7350
4116
3675
4410
3675
6

1622/100000 (67.6
97332
12680
11350
11200
92

663/1000 (1
663
37

663/1000 (1.5
663
3370
3315
55

2992) 7660 (2.56
5984
16760
14960
18000
17952

881) 1000 (1.13
881
1190
881
3090

29.55. 256.

2992
2992
5984
2128
2672
2672
5984
8952064

29
29
261
588
441) 847
42
441

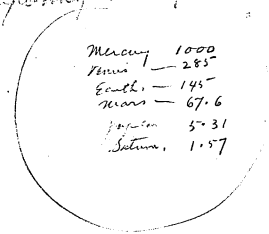
441) 1000 (2.12
882
1180

256
350
606

2.56.

7660
7660
45960
45960
53620
8952064) 53620000 (6.55
53711
7960
7960
32140
32140
7960

Strength [illegible] — [illegible]
[illegible] — [illegible]



Mercury	1
Venus	3.5 less
Earth	6.9
Mars	16.22
Jup	188.00
Saturn	633.00

29
29
261
58
84

8952,0664) 17,732511 (1.9
8 952064
8,780 4470
80 56,576

4211
4211
4211
4211
8422
16844

17732511
19

159592599
17732511
33698 7709

7.952 064) 17,732,511 (4
70,930,044 (7

8952064)

102,400) 17 732511 (173.
10 2400
7,492,80
7 168800
32 71511

15
15
75
15
225

Square the orbital velocity — get its value as compared to mercury square,

Square Mercury, then square the other planet. Div sqr of mercury in the square. Multiply the square in the planet by the product. Multiply by [illegible] then div square of mercury in this, this gives strength [illegible] of force. Mars came out 15.205 should be 16.22.

33691770
4
134767080 (15.05
8952064) 8952064
45,246470
44760320
4861,2000

8

64 | 841 (13
64
201
192

13.

860000
860000
516000
580000
7396

13
4
52.

7396

7.396 0000 (7396
0000
3.86 0000
3.80 0000
4500
4500
600
302

(16 825.

Square of 89 8,952,064.

825.

Jupiter 8952064 | 7.396.000.000 (825
7161 6512
2343478
1790412 8
5530875 20
3171 2384

158 | 825 (4.
752
2930

13 | 825. (63.0
78
49
32
60
52

7396 000000
825
369800000
20000000
1479 000000
5916
6098500000
1113
829 5500000000
6098 500000000
79280 500000000

188
63
564
126
1844
89

86400 | 240000 | 2.8
172800
67200

24
60
14460
86400
1443

24000 | 3.

86000
3
10 | 258000 | 25800.

24.
1000.
60
60
56
21

10
60
60
600
3600 | 25800000 | 7.16
22260000
8600000
8600000

7918
7916
63344
7918
71262
54226
626 | 94624

806
716
90

16

16
2
32.

1.9
2
3.8

8952064 | 79280500000000 | 8850000
71616312
72639882
71616312

2.56
2
5.12

13. Sum Horses.
13
32.

188
366
1128
1128
5664
68881

184
13
552
184
2392

805. | 29557 | 3.66
24418
53700
5490
5390

366
1.80.

29557

18800
1464
75200
11580
75200
18800
275532800

1420 | 29557 | 2.
2358
97

omissions from 440. — 1000

850 — 4 less

1320 — 9

2200 — 16

5 - 3 5 2 0 — 25

6 - 3 7 2 6 — 36

7 - 4 2 9 0 — 49

8 - 1 4 9 6 0 — 64

9 - 2 9 0 0 0 — 81

11 3 8 9 6 0 — 100

11 6 2 9 6 0 — 121

12 1 2 1 9 2 0 — 144

13 1 6 4 9 8 0 — 169

14 2 6 6 9 0 0 — 196

15 2 8 1 6 6 0 — 225

16 — 6 9 5 4 9 0 — 256

17 1 1 3 0 1 6 0 — 289

18 1 8 2 2 6 4 0 — 324

19 2 9 5 8 8 0 0 — 361

20 4 7 8 7 4 9 0 — 400

21 7 7 4 6 2 9 0 — 441

22 — 12 5 — 3 3 6 8 0 — 484

23 — 2 0 2 7 9 9 2 0 — 529

24 — 3 2 8 7 3 6 0 0 — 576

25 — 5 3 0 9 3 5 2 0 — 625

26 — 8 5 7 0 7 1 2 0 — 676

27 — 1 3 9 0 0 0 9 6 4 0 . 729

28 . 2 2 4 9 0 7 7 6 0 . 784

2 3 6 3 9 0 5 6 4 0 0

440 000) 92.333 000 (208.

88 000 00

4 333 000

3 520 000

813 000

208
208
864
416
3 104

440 000) 141.000 000 (320

132 000 00

9 000 000

8 800 000

200 000

176 0000

24 0000

320
320
640
960
1 024 00

440 000
320

270 000
88 000
13 200 00
1 430

440 000
320
320
29 00
128
9 600
1 041 1

440 000) 141.000 000 (320

132 000 00

9 000 000

8 800 000

200 000

81250.

440.) 35.750 000 (81250

35 20

2 550

440

1 150

1 100

2 500

2 200

3 000

81
81
81
549
6561.

440 000) 38 750 000 (41.241

35 200 000

3 550 000

440 000

11 000 000

8 800 000

2 200 000

2 200 000

440 000

172
172
344
688
1 32
23 107

440 000) 66.750 000 (152

44 0000

22 750 000

22 000 000

7 50 0000

4 400 000

3 100 000

1009
1009
9081
1 009
1 018 081

440 000) 450 000 000 (1009

440 000

10 000 000

39 600 000

4 400 000

34

2992

LF 23104) 586 075 600 (2539

Venus

46 208

12 467 6

11 5 52 0

91 5 60

5 4 3 1 2

5 2 2 4 8 0

5 2 0 7 4 3 6

86
9
2 5 8 000.

6561) 1000 000 (152.

6561

3 4 3 8 9 0

3 2 8 0 5

1 5 8 5 3 0

1 5 1 2 2

8

21
21
21
42
47 1.) 2539 (5

29
29
261
78
87 1.

LF 6561) 8952064. (1364.

Mercury

6561

2310
23143
19 0 2 7 6
4 2 2 7 6 0
3 9 3 6 0 9
2 9 1 5 1
2 6 2 4 2

841) 1364 (1.6
841
5 2 3 0
5 0 4 6

4 8 0 0 0 0 0 0
9 6 0 0 0 0 0
2 4 5 0 0 0 0 0 0

Surface of Sun (Earth) — 1

Mercury	6561	times weaker
Venus	23104	"
Earth	43264	"
Mars	102400	"
Jupiter	1,014,081	

Mercury 152.

3257) 1 0 0 0 0 0 0 (1216
3257
7 4 3 0
7 3 5 0
9 0 0 0
8 9 5 0
5 0 0 0
4 8 5 0
1 5 0

6) 2310
385

Mars 1364
Mars 173.
Venus 2539

Mercury — 1.9 — 6:55 from Mars.
6:55 — Less than Venus
8:25 — Less than Jupiter
6

86
86
688
688
365 | 3960
11
365
365
401
3000
4374
24
17260
8630
103560

7396

555000000

8800
6

10 | 258000

25800

92
92
3600
24000
48
12000
47

11 | 18000000 (134
11
33
33
330

13 | 555000000 (42,
52
3500000
3500000
2600000600

103560
256

11
11
11
11
127,

148,12,000,

1,021,000,000

7
7
7
8
10 | 2103560
25800
52848000
5778000
207120

25880,000,000 | 2731,848000 (

2731 848000 | 2880000000 (1.0
2731 848000
1,481,520,000

35 340 000
2
706 800 00
3
88 / 212 049 000 / 2409545
176
360
342
840
792
480
440
400
352
480
440

1188
365
5950
7116
88 / 4328 / 0
3522
805
792
149

86
63
258 000

2409545.
40
21 685 905
96 381 80
120 477

118 067.705

Mary 2 409.545. day
212,040-000 yearly
gap 118 067 705 yearly.

8.1952. / 7.396 000 / 802
7 16 16
00
23,44 904

258 000
365
129 000
1548 000
774 000
94 17 000

118 067 705
94 17 000
23 897 705

60
60
3600
24
17400
7200
86400 | 21.74
3974 | 79948
69274
39460
27818
16420

30 | 2580000 | 86
240
180
180
19

24 | 86000 | 3583
72
140
120
2920
2880

4390 | 86400 | 19
4390
42500
39510
2990
2580
1.

24 | 103200 | 4390
96
72
72
240
216
240

25 | 2580000 | 103200
25
80
75
50
50
0

3583 | 86400 | 24.1
7166
14732
14332
4080

27.

860000
3

27 | 2589000 | 95555
243
150
135
150
135
150
135
0

24 | 95555 | 3981
72
235
216
195
192
3
2

3981 | 86400 | 21.
79962
67801
37890
27990

24 | 95384 | 39
72
238
216
178
168
104

3974 - Rows

860
3

26 | 2580000 | 95384
234
140
130
100
78
220
208
120

7.396-000,000
62 691 000

10) 24 (2.4
20
93

62) 7396 (119
62
119
62
578
558

7918) 860003 (108.8
7918
6820
6328
492

729) 812656 (1703
5103
2356

8600

90) 18110 (212
180
110
90
200

.90) 18380 (242
180
380
360
200

27
27
189
54
729

2 28
4 560
716
716
4296
716
5012
5012
5012

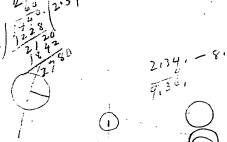
806) 1838 (2.28
1612
2260
1612
6480
6445

24
60
60
1440
1228
2120
1936
1840
2780
2780

614) 1838 (2.34

5) 79
87

2134 - 8.17 lunar dia
9.361



Earth 18.38 miles sec orbital
" less axial 18.11 "
Earth 1.
Jup 27 times weight of earth — X^30
Jup 11.9 times larger — bulk.
" 10.8 larger dia.
orbital vel 2.28 times less. 8.06 miles sec
~~orbital vel~~ axial. 7.16 sec.
orbital less axial .90 mile sec.

Earth's axial .27 mile sec.
Jupiter max 2.4 axials to 1 of earth

1186
1186
7116
9488
1186
1186
1406596

19
19
171
19
361.

86
86
516
688
7396

28.7

70
70
4900,

9
9
81.

2992 | 86000 (28.7
5984
26160
23936
22240

24
4
96.

149769
387

Suns surface moves 3947 miles per hour

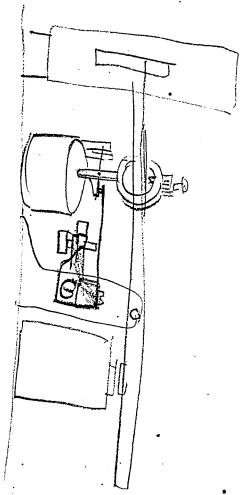
X — speed of Jupiter orbital less axial ... per sec which is 27.2 less than Earth less axial — Jupiter is 27 times weaker [illegible] position.

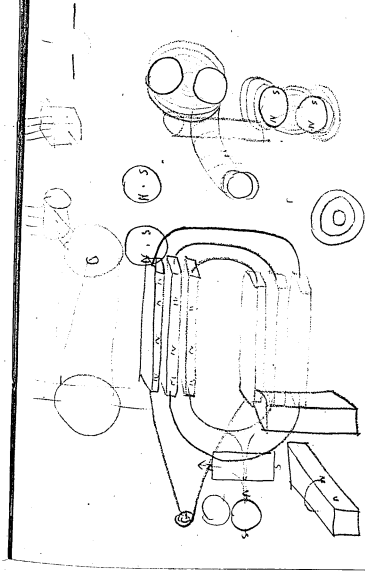
~~Axial Rev is at the Sqr of the dia. (i.e) Square the axial Rev & this will give the dia [illegible] compared with any other planet.~~

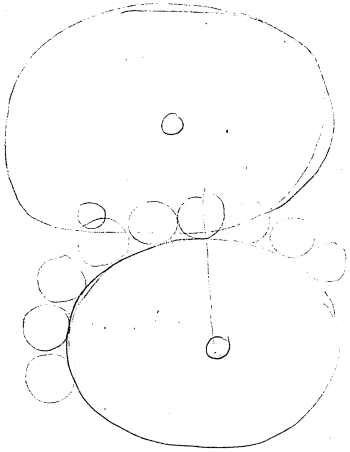
~~Saturn~~ Uranus 81 (~~361~~) times weaker [illegible]

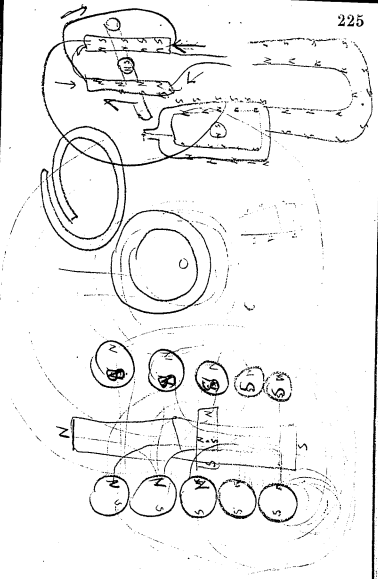
0387 | 0387 0 (

3364
3364








N
S
N
S
N
S
N
S
N
S
N
S
N
S
N
S
N
S

Square mean distance of Ellipse
divide square of greater axis
& square root,

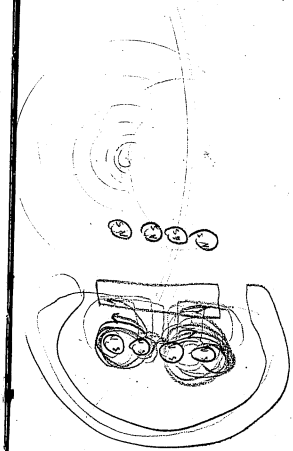
229
229
2061
458
458
52441

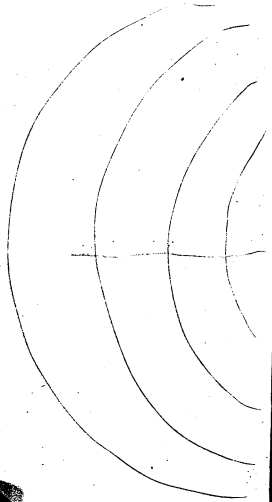
365
365
365
365
401
4114
4
1654.

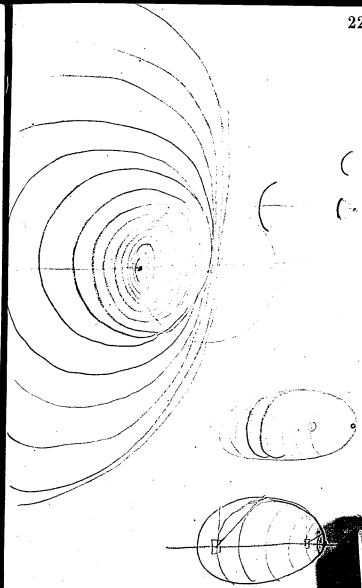
88 | 3652 | 365
352
130
124
420

88 | 4013 | 451
352
473
460
60
414
4114
1656
414
1656
171376
16.58.

45
45
225
180
2025.







24 | 1,296,000 | 54,000
120
96
96
000

24 | 691200 | 28800
48
211
192
192
192
00

$\frac{01}{7} = \frac{01}{7} \times \frac{01}{1}$

105330
24
421320
210660
2527920

42,000,000
28,118,716
14,000,000

77000
24
308200
154100
1848200

9770217844
372233501 29
4789221 3

$\frac{2}{5} \times \frac{1}{5}$

$\frac{01}{100}$

$\frac{4}{5}$

92960489
8989495
1000938

$10 \cdot 10 = \frac{1}{100}$

18357700854
16720001276
163699578

$\frac{0}{2}$

6658 5947
66 677509
9089 38

12

$\frac{1}{1}$

$\frac{1}{7}$

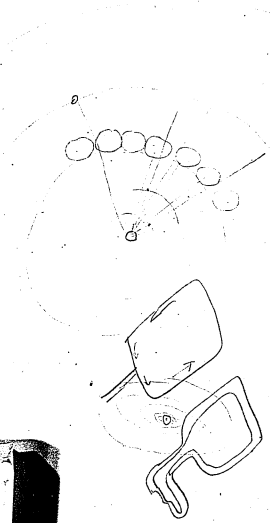
49860 3768
45278 2530
4082 1238

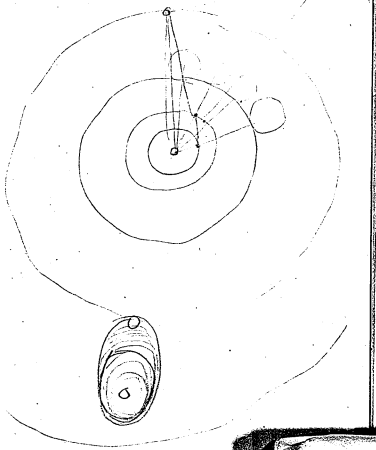
$\frac{1}{10}$

65533
24
16 2132
31 666
107299 2

1
1
12000
24
48000
24000
288,000

$\frac{01}{100}$





85741
13333
14792
10234
47382

85741
38359
47382

5765
1334
1562
2869

5765
2896
2869

785
250
320
164
46

4850
1560
2490
500
300

7874
1160
1729
1957
1433
1993

8642
815
8827

8642
168
647
8827

10000
4397
2498
3104
10001

9999

25000
75-00

~~25000~~
35

25000
75-00
35-00
0-00

20000
4.25-
2.75-
1.50
1.75-
2.25-
5.75-
17 5-

75-000
21000
00

21000
75-00
285-00
35-00
25-000

35-

13

800 00
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3)13853
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7)919 — 2
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2)3717 — 1
3)1858 — 1
5)619 — 4
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105 | 13853 | 132 - 98
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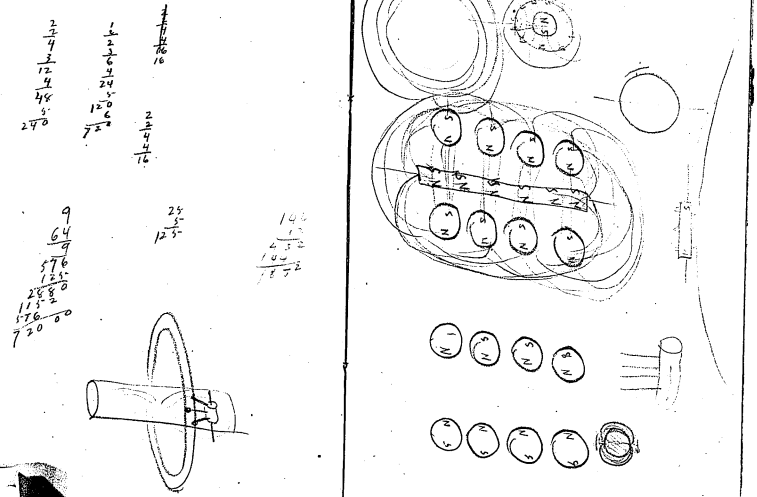
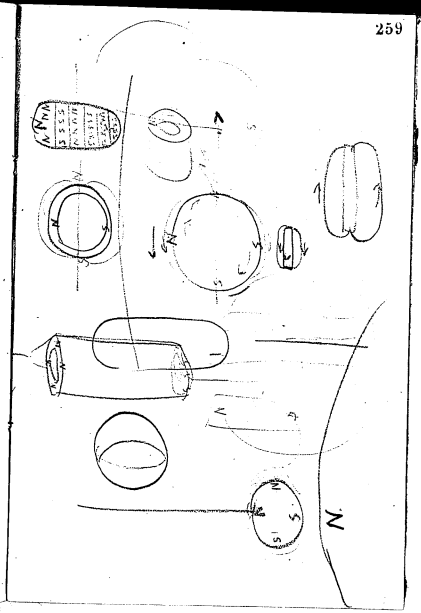




Reasons against an Alternate Current Converter System -

Danger

1st - The pressure on the High tension mains are destructive of life -

2nd Running high pressure mains into stores + houses to connect to converters is dangerous to life.

3rd Converters act as Condensers and notwithstanding two systems (12) high + low are not electrically connected one may get a second thousand volt discharge under certain conditions between the low tension system and the ground

4 - Impossibility without danger of repairing high line when Current on.

5 Disruptive action of reversing Currents require heavy insulation

~~to~~ to

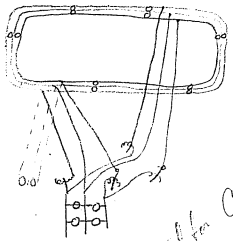
6 ———

7 to get same economy of Conduction
The greatest difference of potential on high line + 2000 Volts low line must be .3 times greater than with Continuous Currents. to do what 2000 Volts Continuous will do.
difference of potential of at least 6000 Volts must be used — If on the low line 2 wire distribution system is used + 100 volt lamps then 140 mean must be used or difference of potential of 280 Volts alternate current If three wire system 560 560 Volts difference potential + this is fatal —
Continuous currents polarize the points where the Current enters the body + prevent its passage. — There is no polarization with alternated Currents hence full Current passes + Kills

8-

As Alternate Current machines must be worked with Continuous or constant field not derived from the main supply current, any short circuiting of line must burn out machine as it is not saved as in Continuous Current system.

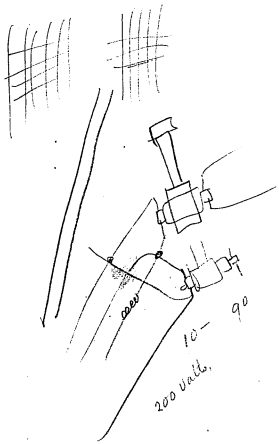
8 The doing away of commutators on Continuous Current machines is no gain as there must be a field energizing dynamo or section on the Alternate Machine & this must have a brush Commutator. Experience has shown that small machines spark worse & generally trouble than big machines —

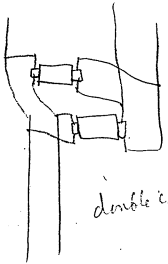


patent for Connected
a patent

1 | 500 amp.
500

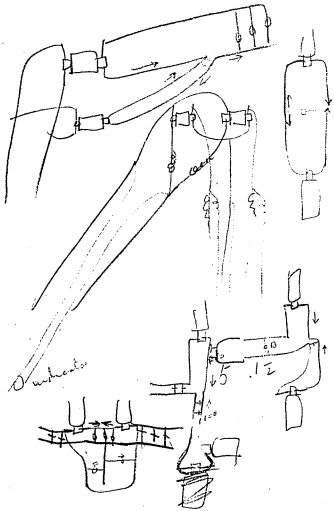
400 | 10000
4000
7500
2000 | 25 amp

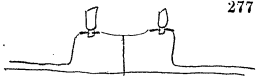


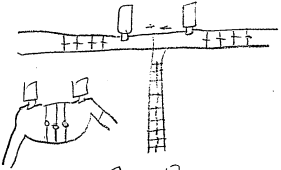


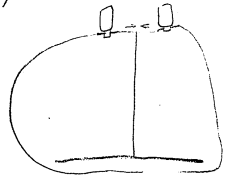
double commutator

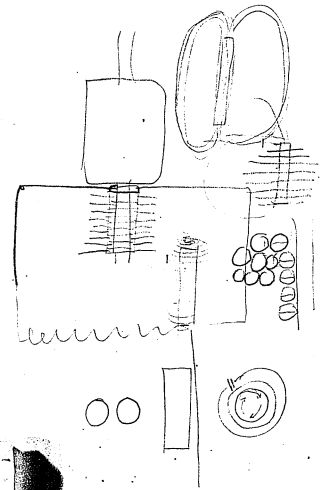
40 volts. 18 volts.
2 pd. 10.
5/
7. 91

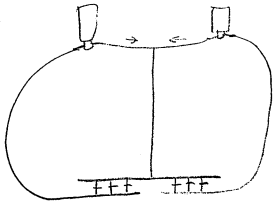


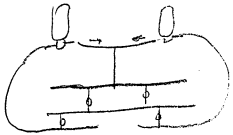


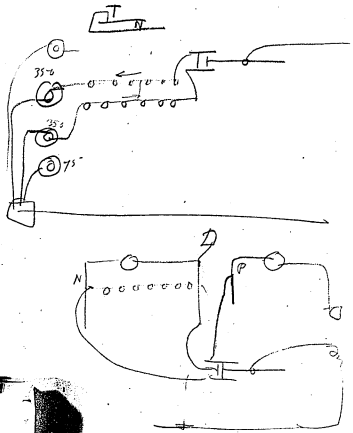








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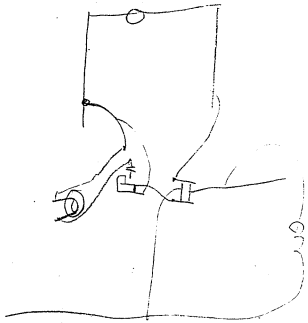
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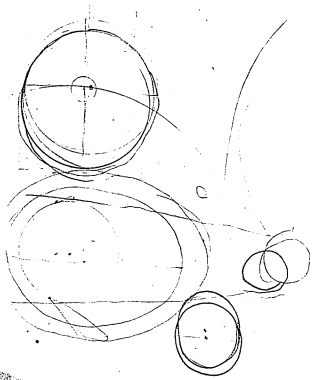

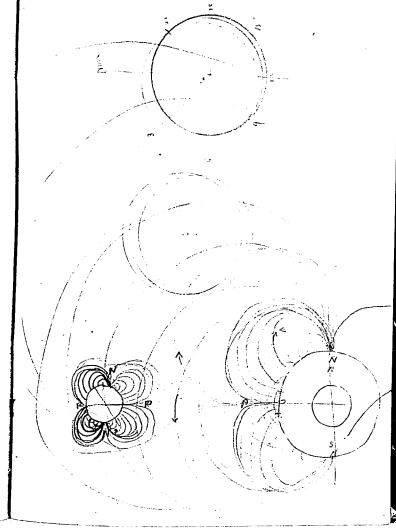
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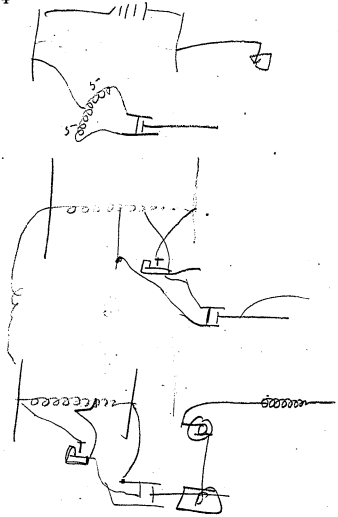
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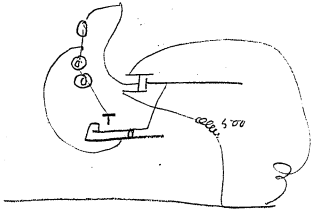

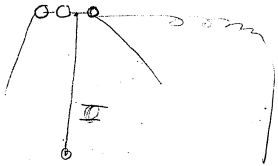

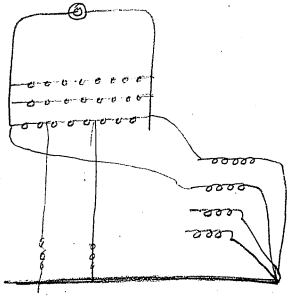

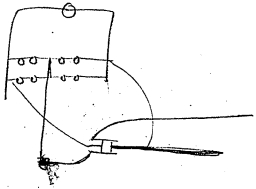

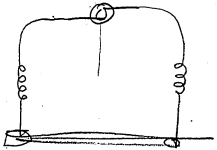

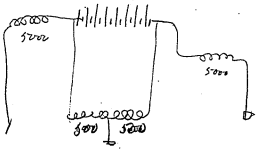
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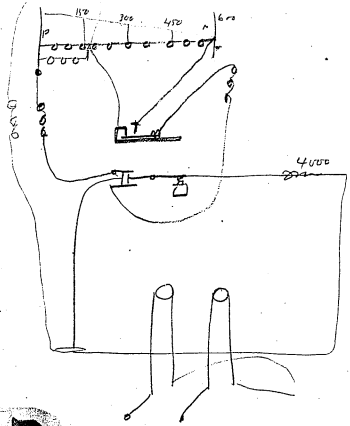
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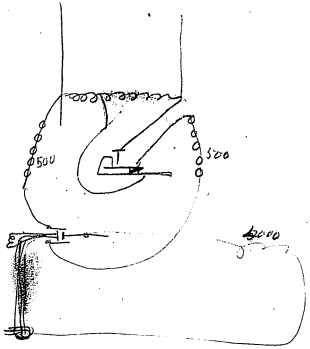

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I.

N.
292 17th ST.